

contradictorily as "a convex jut 19b" (col.9 line 59). Hobo places these elements in the central portion of his blades to form a "spindle shape." Applicant has placed notches 40 and 41 in Figures 5 and 6 to form a broader bone engagement along the entire edge 37 of blade 19. Similarly, in applicant's Figures 7 and 8 notched area 43 causes blade edge 37 to evert yet remain essentially a straight edge giving greater grip within the hole bore without deforming as much bone or tilting the central axis of implant. Applicant has found this to give a lengthier and thus stronger grip than a simple single bulge as shown in Hobo. The single bulge of Hobo can act as a swiveling ball-and-socket. This is especially true in cancellous bone. Applicant is forming notches to evert the edge 37 to bite into the surrounding bone to prevent rotational motion which cannot happen with the single dent or bulge described by Hobo.

Objection to claim 13 is noted. Claim 13 is abandoned.

Applicant offers this response to objections advanced by examiner to reject applicant claim 10 under 35 U.S.C. 103(a) citing Hobo in view of Hinds (6,039,568). A careful review of all arguments supplied by Hobo are directed toward stabilizing "tubular" implant fixtures. He is not pursuing applicant's goal of creating "a truncated conic hollow tube with etched ribs to more closely mimic the taper of the natural tooth root."

Hobo's citing of prior art, is concerned with stabilizing micromotions during mastication in apical expansion type implants with several legs to prevent microleakage. Nowhere does he show any desire to mimic the root form of a tooth. Hinds on the other hand has invented a rigid, solid tooth shaped implant without any expansion elements. Hinds does not show a tube, thin-walled or otherwise. Hind's solid cross-sections in his drawings shows solidly cast implants.

Hinds relies upon a specially shaped hole formed by a vibrating tool to match the contour of the tooth shaped implant. Hinds then press fits the implant in place. Hinds does not suggest any type of a flexible expansion implant. Since Hobo and Hinds are pursuing different goals in diverse directions, their paths do not cross.

Hobo offers no "suggestion or motivation" (MPEP 706.02(j)) for a root shaped implant.

Applicant wishes to minimize trauma to the bone, shorten healing time, and provide more surrounding bone for a more secure support.

Additionally, applicant relies upon the chemical, abrasive or laser milling of a thin walled tube using thin-walled tubing manufacturing techniques, such as seamless welding, casting, electro-depositing on a conductive mandrel or deep drawing. The same techniques are used to form short truncated conic tubes. The expansion tube is manufactured by chemically milling open slots in a thin-walled titanium medical-alloy tube leaving straight ribs or spiral ribs. Applicant's choice of thin walled material gives flexibility to the expanding ribs in order that these ribs conform to and press firmly against the sidewall of the bored hole. Knowledge of materials and manufacturing methods often determine the direction of an inventors thought process. Neither Hobo nor Hinds suggest the use of applicant's chosen manufacturing processes.

Applicant withdraws claims 16, 12, 14 and 15.

What is claimed is:

Claims 1 and 2 are withdrawn.

Withdrawn 1. [A dental implant apparatus with expandable sides for locking into a predrilled hole in bone [comprising] having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw.]


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Withdrawn 2. [A dental implant apparatus, as described in Claim 1, comprising outwardly expanding ribs with a thinned portion on said ribs bowing outward to a greater distance than the thicker portion of said ribs to prevent rotation of said dental implant apparatus during installation and use.]

--3. (Amended) [A dental implant apparatus, as described in Claim 1,] A dental implant apparatus with expandable sides for locking into a predrilled hole in bone [comprising] having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw[.]

comprising said outwardly expanding ribs with a thinned portion on said ribs bowing outward to a greater distance than the thicker portion of said ribs to prevent rotation of said dental implant apparatus during installation and use, said thinned portions on said ribs alternating edges on alternate said ribs.--

Withdrawn 4. [A dental implant apparatus, as described in Claim 1, comprising outwardly expanding ribs with a notched edge on said ribs bowing outward to a greater distance than the un-notched portion of said ribs to prevent rotation of said dental implant apparatus during installation and use.]

 --5. (Amended) A dental implant apparatus with expandable sides for locking into a predrilled hole in bone [comprising] having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut; said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw[.]

[A dental implant apparatus, as described in Claim 1,] comprising outwardly expanding ribs with a notched edge on said ribs bowing outward to a greater distance than the un-notched edge of said ribs to prevent rotation of said dental implant apparatus during installation and use, said notched edges on said ribs alternating edges of alternate said ribs. --

--6. (Amended) [A dental implant apparatus, as described in Claim 1,] A dental implant apparatus with expandable sides for locking into a predrilled hole in bone [comprising] having an

upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw[.]

comprising comprising outwardly expanding ribs with narrowed portions on said ribs bowing to a smaller radius than the un-narrowed portions of said ribs to prevent rotation of said dental implant apparatus during installation and use. --

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-- 7. (Amended) [A dental implant apparatus, as described in Claim 1,] A dental implant apparatus with expandable sides for locking into a predrilled hole in bone [comprising] having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw[.]

comprising outwardly expanding ribs with narrowed portions on said ribs bowing to a smaller radius than the un-narrowed portions of said ribs to prevent rotation of said dental implant apparatus during installation and use, said narrowed portions on said ribs alternating edges of alternate said ribs. --

Withdrawn 8. A dental implant apparatus, as described in Claim 1, comprising outwardly expanding ribs having edges parallel to the axis of said hollow expansion tube.

-- 9. (Amended) [A dental implant apparatus, as described in Claim 1,] A dental implant apparatus with expandable sides for locking into a predrilled hole in bone [comprising] having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw[.]
comprising outwardly expanding ribs, said ribs having edges that spiral about the central axis of said hollow expansion tube.--

--10. (Amended) [A dental implant apparatus, as described in Claim 1,] A dental implant apparatus with expandable sides for locking into a predrilled hole in bone having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw
comprising a hollow expansion tube having a truncated conical shape to better mimic the normal root shape of a tooth. --

--11. (Amended) [A dental implant apparatus, as described in Claim 1,] A dental implant apparatus with expandable sides for locking into a predrilled hole in bone [comprising] having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw[.]

comprising outwardly expanding ribs with spaces through portions on said ribs forming spines extending to a greater diameter than the un-spaced portions of said ribs to prevent rotation of said dental implant apparatus during installation.--

or
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Claims 12 through 16 are withdrawn.

12. [A dental implant apparatus, as described in Claim 1, comprising said retaining compression screw having a head with anti-rotational retaining means mating with the underside of a dental abutment.]

13. [A dental implant apparatus, as described in Claim 1, comprising said retaining compression screw having a head with slotted anti-rotational retaining means mating with a tongue on the underside of a dental abutment.]

14. [A dental implant apparatus, as described in Claim 1, comprising said retaining compression screw having a head with tapered, hexagonal anti-rotational retaining means mating with a tapered hexagonal recess in the underside of a dental abutment.]

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A. 15. [A dental implant apparatus as described in Claim 1, comprising perforations through
said ribs to allow increased flexibility and interlocking bone growth.]

16. [A dental implant apparatus as described in Claim 1, comprising a bone growth
promoting coating on portions of said implant.]

A Clean copy of the amended claims follows:

What is claimed is:

--3. (Amended) A dental implant apparatus with expandable sides for locking into a predrilled hole in bone having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw comprising said outwardly expanding ribs with a thinned portion on said ribs bowing outward to a greater distance than the thicker portion of said ribs to prevent rotation of said dental implant apparatus during installation and use, said thinned portions on said ribs alternating edges on alternate said ribs.--

--5. (Amended) A dental implant apparatus with expandable sides for locking into a predrilled hole in bone having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw comprising outwardly expanding ribs with a notched edge on said ribs bowing outward to a greater distance than the un-notched edge of said ribs to prevent rotation of said dental implant

apparatus during installation and use, said notched edges on said ribs alternating edges of alternate said ribs. --

--6. (Amended) A dental implant apparatus with expandable sides for locking into a predrilled hole in bone having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;
said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut;
and said ribs expanding outward upon the tightening of said retaining compression screw comprising outwardly expanding ribs with narrowed portions on said ribs bowing to a smaller radius than the un-narrowed portions of said ribs to prevent rotation of said dental implant apparatus during installation and use. --

-- 7. (Amended) A dental implant apparatus with expandable sides for locking into a predrilled hole in bone having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;
said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut;
and said ribs expanding outward upon the tightening of said retaining compression screw comprising outwardly expanding ribs with narrowed portions on said ribs bowing to a smaller radius than the un-narrowed portions of said ribs to prevent rotation of said dental implant apparatus during installation and use, said narrowed portions on said ribs alternating edges of alternate said ribs. --

-- 9. (Amended) A dental implant apparatus with expandable sides for locking into a predrilled hole in bone having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw comprising outwardly expanding ribs, said ribs having edges that spiral about the central axis of said hollow expansion tube.--

--10. (Amended) A dental implant apparatus with expandable sides for locking into a predrilled hole in bone having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformal socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw comprising a hollow expansion tube having a truncated conical shape to better mimic the normal root shape of a tooth. --

--11. (Amended) A dental implant apparatus with expandable sides for locking into a predrilled hole in bone having an upper conformal socket, a hollow expansion tube with a wall having alternating ribs and open spaces, and a lower retaining nut;

said hollow expansion tube compressible along a major axis by tightening a retaining compression screw through said conformed socket, said expansion tube and said retaining nut; and said ribs expanding outward upon the tightening of said retaining compression screw comprising outwardly expanding ribs with spaces through portions on said ribs forming spines extending to a greater diameter than the un-spaced portions of said ribs to prevent rotation of said dental implant apparatus during installation.--

Respectfully submitted.

A handwritten signature in black ink, appearing to read 'E. L. Schacht', with a stylized, cursive script.

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